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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/241,636	HEATH ET AL.	
	Examiner	Art Unit	
	Jeanine A. Goldberg	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *63-109* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *63-109* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the papers filed January 16, 2007. Currently, claims 63-109 are pending.

2. The petition filed January 16, 2007 requesting revival of the instant application was granted by the Office of Petitions on January 31, 2007.

3. All arguments have been thoroughly reviewed but are deemed non-persuasive for the reasons which follow. This action is made FINAL.

4. Any objections and rejections not reiterated below are hereby withdrawn.

Maintained Rejections

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 63-67, 69-73, 81-82, 84, 87-90, 101-109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harvey et al. (US Pat. 5.939,259, August 1999) in view of Rudi et al. (WO 98/51693, November 19, 1998).

Harvey teaches a method and device for collecting and storing clinical samples for genetic analysis. Harvey teaches a process for characterizing DNA by isolating nucleic acids which comprises contacting a biological material with a solid support

treated with a lysing reagent (i.e. a absorbent material that is impregnated with chaotropic salt); b) treating the biological material with a DNA purifying agent (i.e. water and vortex), c) purifying the DNA from the remainder (i.e. supernatant) d) analyzing the purified DNA (i.e. PCR reactions and electrophoresis)(col. 5, lines 25-55). Moreover, Harvey specifically teaches fabricating an absorbent material with a roll of 903 paper which is impregnated with guanidine thiocyanate solution having a concentration between 0.5M and 5.0 M. The paper is allowed to dry (col. 5, lines 10-22). Harvey teaches isolating DNA from fecal sources, saliva sources, and whole blood sources (limitations of Claim 71-72, 89). Specifically, two separate squares of 903 paper are exposed to samples, one paper treated and the other paper untreated (limitations of Claim 90). The samples was allowed to dry and the papers was transferred to a centrifuge tube containing water and vortexed (col. 5, lines 30-35)(limitations of Claim 69). The paper was further transferred to a second centrifuge tube containing water and placed on a heating block at 95 degrees for 30 minutes (col. 5, lines 35-40)(limitations of Claim 70). The supernatant from each sample was amplified and analyzed by electrophoresis on a polyacylamide gel which were visualized by silver staining (Example 6). Moreover Harvey specifically claims a method for collecting nucleic acids from a whole blood source by contacting a whole blood source with an adsorbent material that has a chaotropic salt impregnated, allowing the source to be absorbed on the absorbent material and eluting the nucleic acids into a solution that can be used in a nucleic acid amplification process (col. 8)(limitations of Claim 88, 101-102).

Harvey does not specifically teach a method which uses an RNA digesting enzyme.

However, Rudi et al. (herein referred to as Rudi) teaches a method of solid-phase nucleic acid isolation. Rudi teaches "if it is desired to remove RNA from DNA, this may be achieved by destroying the RNA." Rudi teaches that this may be done by the addition of an RNAase or an alkali such as NaOH (page 15, lines 34-36)(limitations of Claim 67). Rudi further teaches that any cell including prokaryotic and eukaryotic cells, mammalian and non-mammalian cells, bacteria may be used (page 4). Further samples comprising these materials may include foods, clinical and environmental samples including soil, water or food samples (limitations of Claims 73). Moreover, Rudi teaches analyzing the nucleic acids following isolation (page 17). Rudi discusses detecting nucleic acids using hybridization, PCR, minisequencing (limitations of Clams 82, 84, 87, 88)

Therefore, it would have been prima facie obvious, at the time the invention was made to have modified the solid phase lysis and detection method of Harvey to include contacting the solid phase with an RNAse. Harvey specifically teaches that if it is desired to remove RNA from DNA this may be done by addition of an RNAase (page 15). Therefore, the ordinary artisan would have been motivated to have removed RNA from a sample to enable detection of DNA. The ordinary artisan would have been motivated to have added a RNAase to the lysing reagent to enable the rapid detection of DNA without an additional step. The ordinary artisan would have had a reasonable expectation of success for modifying the impregnated solid support comprising a lysing

reagent with an RNAase to enable a simultaneous method for lysis and removal of RNA.

Further, the ordinary artisan would have been motivated to have used any of the samples taught in the art for the efficient detection of nucleic acids. Rudi teaches many sources and samples may be used. The ordinary artisan would have been motivated to have used any of the variety of samples taught as successful by Rudi for the express benefit of analyzing a variety of samples.

Additionally, Rudi teaches the following isolation the purified nucleic acid may be analyzed using sequencing, minisequencing, PCR, hybridization for example. The ordinary artisan would have been motivated to have taken the purified nucleic acid obtained by Harvey in view of Rudi and further analyzed the sample to obtain information regarding the nucleic acid. While Harvey teaches the nucleic acid may be used for PCR reactions, the additional analysis methods taught by Rudi would have a reasonable expectation of success to analyze the nucleic acids purified. Thus, the ordinary artisan would have been motivated to have analyzed the nucleic acids using any of the know methods depending on the desired results of the analysis.

Response to Arguments

The response traverses the rejection. The response asserts that the combination of Harvey and Rudi would not have been obvious because "such an invention would be de facto lacking any utility." The response asserts that Rnase would have been denatured in the presence of guanidinium isothiocyanate and unable to enzymatically destroy the RNA. The response asserts that "it is will known to those skilled in the art

that Rnase unfold and/or denatures in the presence of such strong denaturing reagents such as taught by Harvey even at concentrations as low as 0.1 M. First, MPEP 716.01(c) makes clear that "The arguments of counsel cannot take the place of evidence in the record. In re Schulze , 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). Examples of attorney statements which are not evidence and which must be supported by an appropriate affidavit or declaration include statements regarding unexpected results, commercial success, solution of a long - felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant." Here, the statements regarding the inoperability of RNase at low concentrations of guanidinium isothiocyanate must be supported by evidence, not argument.

It is noted that the combination of references does not rely on guanidinium isothiocyanate, but guanidine thiocyanate.

Further, this argument has been considered but is not convincing because the prior art does not appear to support applicants arguments. Ahmad teaches changes in denaturation of ribonuclease A by mixed denaturants including guanidinium denaturants. Ahmad teaches that the conformational free energy is not affected by the presence of low concentrations of guanidine hydrochloride which by themselves do not disrupt the structure of native ribonuclease A. Ahmad teaches combinations of denaturants and illustrates activity levels. It is not clear, as applicants suggest, that Rnase is denatured and rendered unusable at low concentrations (see Figure 1, 2, 3), for example.

Thus for the reasons above and those already of record, the rejection is maintained.

6. Claims 63-67, 69, 71-73, 81-90, 101-109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boom et al (5,234,809) in view of Shieh (US Pat. 6,054,039, April 2000) in view of Rudi et al. (WO 98/51693, November 19, 1998).

Boom teaches methods of characterizing DNA. Boom discloses a process which involved contacting the biological material that contains DNA with a solid support that had been treated with a lysing reagent (i.e. a chaotropic substance), treating the biological material with a purifying reagent, and purifying the DNA (col. 4, lines 3-59). The chaotropic substance (lysing reagent) is contacted with silica particles (solid support). The biological material is then treated with purifying reagents, and the remainder of the biological matter is purified (washing buffer, alcohol washing solution and acetone. Additionally, the process described by Boom produces DNA which can be further used to "demonstrate NA sequences by means of an amplification method such as the PCR method...." (col.4, lines 48-50)(limitations of claims 87-88). Boom teaches that the Gus SCN (i.e. the lysis reagent) is added to the solid support (i.e. the silica beads) prior to addition of biological material. Boom teaches silicon dioxide supports, nitrocellulose supports, latex particles (col. 5-6)(limitations of claims 90). As described in Boom, the DNA may be eluted from the solid support by means of an eluting reagent (col.4, line 33). Boom teaches an eluting reagent can be TE buffer, aqua bidest or PCR buffer. Boom further teaches the process where in the solid support is contained in a single vessel (col.4, lines 34-36) (limitations of claims 69). Boom demonstrates the use

of isolating nucleic acids from a nucleic acid-containing biological material (col. 1, lines 10-20). The biological material stated includes tissues, cell cultures, blood, urine, and saliva (body fluids)(limitations of claims 71-72). The nucleic acid was taught to be examined by gel electrophoresis (col. 10, lines 13-24) (limitations of claims 82-85). This method may be used for characterizing the biological material and monitoring impurities. Yields were also taught in example A1 (col. 12, lines 46-48)(limitations of claim 83). Eluted DNA was treated with a restriction enzyme, electrophoresed and visualized (col. 12 65-68) (limitations of claims 86). Boom also teaches hybridization analysis of the isolated nucleic acids (col. 9, lines 19-21)(limitations of claims 87-88). Boom teaches a method which can "provide a process with which nucleic acid can be isolated immediately..." (col. 1, lines 64-67). Boom teaches lysis buffers containing Tris (buffer), aqua bidest, GuSCN, and EDTA (col. 6, lines 39-68).

Boom does not explicitly teach using a solid support in which the lysing reagent is bound, and unbound lysing reagent is removed prior to the contacting of the biological treatment.

However, Shieh teaches a method for lysing cells. Specifically, Shieh teaches the modification of a membrane strip to produce lysis of red blood cells that contacts it (col. 6, lines 17-20). Shieh teaches that membranes such as polymer treated glass fibers, polyamides, cellulose, polyesters may be used (col. 10, lines 42-57)(limitations of Claims 90). Shieh teaches preparing a lysing component by treating the membranes with a lysing agent (col. 10, lines 65-67). Shieh teaches that lysing agents included Mega 8, Triton X, lauryl sulfate salts, TEA salts, sodium salt, among numerous others

(col. 11, lines 1-10)(limitations of Claims 94). Furthermore, Shieh teaches that the lysing agent may be coated onto the membrane by any method used in the art for coating solutions onto films such as dip coating an aqueous solution or disperson of the lysing solution onto the membrane and allowing to dry (col. 11, lines 10-20). As provided in Example 1D, a cell lysing membrane was prepared (col. 12, lines 8-18). Furthermore, Shieh teaches that "this component caused lysis of whole blood when it passed across the membrane (col. 14, lines 31-33). Shieh teaches that the method and sensor may be used "on the spot: at home, in a physicians office or in a hospital room". Shieh also teaches the sensor is low cost and disposable (col. 15, lines 55-60).

Further, Rudi et al. (herein referred to as Rudi) teaches a method of solid-phase nucleic acid isolation. Rudi teaches "if it is desired to remove RNA from DNA, this may be achieved by destroying the RNA." Rudi teaches that this may be done by the addition of an RNAase or an alkali such as NaOH (page 15, lines 34-36)(limitations of Claim 67). Rudi further teaches that any cell including prokaryotic and eukaryotic cells, mammalian and non-mammalian cells, bacteria may be used (page 4). Further samples comprising these materials may include foods, clinical and environmental samples including soil, water or food samples (limitations of Claims 73). Moreover, Rudi teaches analyzing the nucleic acids following isolation (page 17). Rudi discusses detecting nucleic acids using hybridization, PCR, minisequencing (limitations of Clams 82, 84, 87, 88)

Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Boom, which

characterizes DNA using a solid support, lysing reagent and a biological material with a pre-treated membrane of Shieh. Shieh teaches that biological samples may be lysed using a pre-treated membrane such that lysis is caused when a sample is passed across the membrane. The ordinary artisan would have been motivated to have produced a solid support which was pre-treated with a lysing reagent, as taught by Shieh, for the expected benefit taught by Shieh as low cost and disposability. The ordinary artisan would also have been motivated to have prepared the pre-treated lysing membranes, of Shieh, for use in the method, of Boom, for the expected benefit of convenience. Moreover, the skilled artisan would have had a reasonable expectation of success for analyzing DNA from a solid support that was pretreated with a lysing reagent since Boom teaches a method in which all three components, a lysing reagent, solid support and nucleic acid sample, were contacted with successful results.

Further, the ordinary artisan would have been motivated to have used any of the samples taught in the art for the efficient detection of nucleic acids. Rudi teaches many sources and samples may be used. The ordinary artisan would have been motivated to have used any of the variety of samples taught as successful by Rudi for the express benefit of analyzing a variety of samples.

Additionally, Rudi teaches the following isolation the purified nucleic acid may be analyzed using sequencing, minisequencing, PCR, hybridization for example. The ordinary artisan would have been motivated to have taken the purified nucleic acid obtained by Harvey in view of Rudi and further analyzed the sample to obtain information regarding the nucleic acid. While Boom in view of Shieh teaches the nucleic

acid may be used for PCR reactions, the additional analysis methods taught by Rudi would have a reasonable expectation of success to analyze the nucleic acids purified. Thus, the ordinary artisan would have been motivated to have analyzed the nucleic acids using any of the know methods depending on the desired results of the analysis.

Thus, the skilled artisan would have combined the teachings of Boom with the teachings of Shieh in further view of Rudi.

Response to Arguments

The response traverses the rejection. The response asserts the combination of references to not teach or suggest an arrangement of a lysing matrix treated with a lysing reagent and a RNA digesting enzyme. This argument has been considered but is not convincing because the response fails to point to any missing elements of the combination. Moreover, the response directs the examiners attention to the discussion in Item 5. This argument has been reviewed above for the reasons above and those already of record, the rejection is maintained.

7. Claims 63-67, 69-85, 87-90, 94-96, 101-109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deggerdal (WO 96/18731) in view of Shieh (US Pat. 6,054,039, April 2000) in view of Rudi et al. (WO 98/51693, November 19, 1998).

Deggerdal teaches methods of characterizing DNA. Deggerdal discloses a "method of isolating nucleic acid from a sample, said method comprising contacting said sample with a detergent and a solid support, whereby soluble nucleic acid in said sample is bound to the support, and separating said support with bound nucleic acid

from the sample" (pg 5, para 2). Deggerdal teaches that the "nucleic acid-containing sample may be contacted with the detergent and solid phase which may be added to the sample prior to, simultaneously with, or subsequently to the detergent (which functions in the method to lyse)"(pg 7, para 3, lines 22-29). The solid support was contained in a vessel (pg 26, line 18)(limitations of Claim 69). Deggerdal teaches isolation of nucleic acids and the elution of the nucleic acid by heating to 65 C for 5-10 minutes (pg 12, para 3, line 3)(limitations of claims 70). The samples may be of "any material containing nucleic acid" (pg 6, para 1, line 1-3)(limitations of claims 71-73). Deggerdal teaches a method of DNA isolation from cultured cells which indicates the number of cells used as starting material (pg 33, line 1) (limitations of claims 74-76). The purified DNA was then analyzed by PCR and visualized on agarose gel electrophoresis (pg 20, lines 29-32)(limitations of Claims 80). Detection of extra bands indicated contamination (pg 17, lines 26-27)(limitations of Claims 79). The solid support was taught to be made of "glass, silica, latex or a polymeric material" (pg 9, para 3)(limitations of claim 90). Deggerdal teaches an example where cells were lysed using DNA DIRECT Dynabeads and the lysate from each sample was further characterized (pg 35, lines 6-35)(limitations of claim 77-78). Deggerdal teaches the lysing reagent as a detergent. This detergent may be supplied in simple aqueous solution (pg 8, line 7). Further any suitable buffer (Tris) is taught. The reagent may also include components such as enzymes, chelating agents and reducing agents (pg 8, lines 7-23).

Deggerdal does not explicitly teach using a solid support in which the lysing reagent is bound, and unbound lysing reagent is removed prior to the contacting of the biological treatment.

However, Shieh teaches a method for lysing cells. Specifically, Shieh teaches the modification of a membrane strip to produce lysis of red blood cells that contacts it (col. 6, lines 17-20). Shieh teaches that membranes such as polymer treated glass fibers, polyamides, cellulose, polyesters may be used (col. 10, lines 42-57)(limitations of Claims 33). Shieh teaches preparing a lysing component by treating the membranes with a lysing agent (col. 10, lines 65-67). Shieh teaches that lysing agents included Mega 8, Triton X, lauryl sulfate sals, TEA sals, sodium salt, among numerous others (col. 11, lines 1-10)(limitations of Claims 61-62). Furthermore, Shieh teaches that the lysing agent may be coated onto the membrane by any method used in the art for coating solutions onto films such as dip coating an aqueous solution or disperson of the lysing solution onto the membrane and allowing to dry (col. 11, lines 10-20). As provided in Example 1D, a cell lysing membrane was prepared (col. 12, lines 8-18). Furthermore, Shieh teaches that "this component caused lysis of whole blood when it passed across the membrane (col. 14, lines 31-33). Shieh teaches that the method and sensor may be used "on the spot: at home, in a physicians office or in a hospital room". Shieh also teaches the sensor is low cost and disposable (col. 15, lines 55-60).

Further, Rudi et al. (herein referred to as Rudi) teaches a method of solid-phase nucleic acid isolation. Rudi teaches "if it is desired to remove RNA from DNA, this may be achieved by destroying the RNA." Rudi teaches that this may be done by the

addition of an RNAase or an alkali such as NaOH (page 15, lines 34-36)(limitations of Claim 67). Rudi further teaches that any cell including prokaryotic and eukaryotic cells, mammalian and non-mammalian cells, bacteria may be used (page 4). Further samples comprising these materials may include foods, clinical and environmental samples including soil, water or food samples (limitations of Claims 73). Moreover, Rudi teaches analyzing the nucleic acids following isolation (page 17). Rudi discusses detecting nucleic acids using hybridization, PCR, minisequencing (limitations of Clams 82, 84, 87, 88)

Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Deggerdal, which characterizes DNA using a solid support, lysing reagent and a biological material with the method and pre-treated membrane of Shieh. Shieh teaches that biological samples may be lysed using a pre-treated membrane such that lysis is caused when a sample is passed across the membrane. The ordinary artisan would have been motivated to have produced a solid support which was pre-treated with a lysing reagent, as taught by Shieh, for the expected benefit taught by Shieh as low cost and disposability. The ordinary artisan would also have been motivated to have prepared the pre-treated lysing membranes, of Shieh, for use in the method, of Deggerdal, for the expected benefit of convenience. Moreover, the skilled artisan would have had a reasonable expectation of success for analyzing DNA from a solid support that was pretreated with a lysing reagent since Deggerdal teaches a method in which all three components, a lysing reagent, solid support and nucleic acid sample, were contacted with successful results.

Further, the ordinary artisan would have been motivated to have used any of the samples taught in the art for the efficient detection of nucleic acids. Rudi teaches many sources and samples may be used. The ordinary artisan would have been motivated to have used any of the variety of samples taught as successful by Rudi for the express benefit of analyzing a variety of samples.

Additionally, Rudi teaches the following isolation the purified nucleic acid may be analyzed using sequencing, minisequencing, PCR, hybridization for example. The ordinary artisan would have been motivated to have taken the purified nucleic acid obtained by Harvey in view of Rudi and further analyzed the sample to obtain information regarding the nucleic acid. While Deggerdal in view of Shieh teaches the nucleic acid may be used for PCR reactions, the additional analysis methods taught by Rudi would have a reasonable expectation of success to analyze the nucleic acids purified. Thus, the ordinary artisan would have been motivated to have analyzed the nucleic acids using any of the know methods depending on the desired results of the analysis.

Thus, the skilled artisan would have combined the teachings of Deggerdal with the teachings of Shieh in view of Rudi.

Response to Arguments

The response traverses the rejection. The response asserts the combination of references to not teach or suggest an arrangement of a lysing matrix treated with a lysing reagent and a RNA digesting enzyme. This argument has been considered but is not convincing because the response fails to point to any missing elements of the

combination. Moreover, the response directs the examiners attention to the discussion in Item 5.

The lysis buffers of Deggerdal include SDS, TE and/or Nacl or LiCl or LiDS or SDS It is noted that the instant specification specifically is drawn to sodium, potassium, lithium salts including dodecylsulfate (see specification page 21). Thus, the lysis reagents of the instant specification appear to be those taught by Deggredal. The arguments directed to guanidinium isothiocyanate do not appear to be appropriate in view of the teachings of Deggredal.

This argument has been reviewed above for the reasons above and those already of record, the rejection is maintained.

8. Claims 95, 97-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boom (5,234,809) in view of Shieh (US Pat. 6,054,039, April 2000) in view of Rudi et al. (WO 98/51693, November 19, 1998) as applied to Claims 63-67, 69, 71-73, 82-90, 101-109 above, and further in view of in view of Deggerdal (WO 96/18731).

Neither Boom, nor Shieh teaches a lysing reagent which does not contain a buffer.

Deggerdal, however, teaches a lysing reagent as a detergent. This detergent may be supplied in simple aqueous solution (pg 8, line 7). Further any suitable buffer (Tris) is taught. The reagent may also include components such as enzymes, chelating agents and reducing agents (pg 8, lines 7-23) (limitations of claims 37-41).

Therefore, it would have been prima facie obvious to one of ordinary skill at the time of the invention was made to have modified the method of Boom in view of Shieh to include the use of the lysing reagents taught in Deggerdal. The ordinary artisan would have been motivated to use the lysing reagents taught in Deggerdal because the lysing reagents taught in Deggerdal were readily available.

Response to Arguments

The response traverses the rejection. The response asserts the combination of references to not teach or suggest an arrangement of a lysing matrix treated with a lysing reagent and a RNA digesting enzyme. This argument has been considered but is not convincing because the response fails to point to any missing elements of the combination. Moreover, the response directs the examiners attention to the discussion in Item 5. This argument has been reviewed above for the reasons above and those already of record, the rejection is maintained.

9. Claims 68, 99-100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boom (5, 804,684) in view of Shieh (US Pat. 6,054,039, April 2000) in view of Rudi et al. (WO 98/51693, November 19, 1998) as applied to Claims above 63-67, 69, 71-73, 82-90, 101-109 or Deggerdal (WO 96/18731) in view of Shieh (US Pat. 6,054,039, April 2000) in view of Rudi et al. (WO 98/51693, November 19, 1998) as applied to Claims above 63-67, 69-80, 82-85, 87-90, 93-96, 101-109 or Harvey et al. (US Pat. 5.939,259, August 1999) in view of Rudi et al. (WO 98/51693, November 19, 1998) as applied to

Claims 63-67, 69-73, 82, 84, 87-90, 101-109 above and further in view of Su (5,804684).

Neither Boom in view of Shieh nor Deggerdal in view of Shieh nor Harvey specifically teach the eluting reagent as specified in the claims.

However, Su teaches the elution buffer to be 5 mM Tris HCl, pH 9, and 0.5 mM EDTA (col. 10, line 17).

Therefore, it would have been prima facie obvious to one of ordinary skill at the time of the invention was made to have modified the method of Boom in view of Shieh or Deggerdal in view of Shieh or Harvey to include the use of the elution buffer described in the method of Su. The ordinary artisan would also have expected that using the elution buffer of Su in the method of Boom or Deggerdal or Harvey with the elution buffer described in Su would have provided equivalent results.

Response to Arguments

The response traverses the rejection. The response asserts the combination of references to not teach or suggest an arrangement of a lysing matrix treated with a lysing reagent and a RNA digesting enzyme. This argument has been considered but is not convincing because the response fails to point to any missing elements of the combination. Moreover, the response directs the examiners attention to the discussion in Item 5. This argument has been reviewed above for the reasons above and those already of record, the rejection is maintained.

10. Claims 92-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boom (5, 804,684) in view of Shieh (US Pat. 6,054,039, April 2000) in view of Rudi et al. (WO 98/51693, November 19, 1998) as applied to Claims above 63-67, 69, 71-73, 82-90, 101-109 or Deggerdal (WO 96/18731) in view of Shieh (US Pat. 6,054,039, April 2000) in view of Rudi et al. (WO 98/51693, November 19, 1998) as applied to Claims above 63-67, 69-80, 82-85, 87-90, 93-96, 101-109 or Harvey et al. (US Pat. 5.939,259, August 1999) in view of Rudi et al. (WO 98/51693, November 19, 1998) as applied to Claims 63-67, 69-73, 82, 84, 87-90, 101-109 above and further in view of Arnold (5,599,667).

Neither Boom, Deggerdal, nor Shieh, nor Harvey specifically teach using polyolefin as a solid support wherein polyolefin is hydrophilic and has a charge.

However, Arnold teaches polycationic solid supports that can be used purification of nucleic acids (see abstract). The polycationic support matrix is taught to include inorganic and organic materials which include glasses, polyolefins and polysaccharides (col.8, lines 55-62).

Therefore, it would have been prima facie obvious to one of ordinary skill at the time of the invention was made to have modified the method of Boom or Deggerdal in view of Shieh or Harvey to include the solid supports of Arnold in order to make the claimed invention as a whole. The ordinary artisan would be motivated to have substituted polyolefins as a solid support in the Boom or Deggerdal or Harvey method because Arnold taught that polyolefins and glass are both suitable for DNA isolation because they meet the same "principle requirement" of "not unduly adsorbing either

contaminants or nucleotide probes (col. 8, lines 61-64). Consequently Arnold shows that the silica of Boom or Deggerdal and the polyolefins of the claims are equivalent.

Response to Arguments

The response traverses the rejection. The response asserts the combination of references to not teach or suggest an arrangement of a lysing matrix treated with a lysing reagent and a RNA digesting enzyme. This argument has been considered but is not convincing because the response fails to point to any missing elements of the combination. Moreover, the response directs the examiners attention to the discussion in Item 5. This argument has been reviewed above for the reasons above and those already of record, the rejection is maintained.

11. Claim 91 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boom (5, 804,684) in view of Shieh (US Pat. 6,054,039, April 2000) in view of Rudi et al. (WO 98/51693, November 19, 1998) or Deggerdal (WO 96/18731) in view of Shieh (US Pat. 6,054,039, April 2000) in view of Rudi et al. (WO 98/51693, November 19, 1998) or Harvey et al. (US Pat. 5.939,259, August 1999) in view of Rudi et al. (WO 98/51693, November 19, 1998) and further in view of Arnold (5,599,6667) as applied to claim 92-93 above, and further in view of Hasebe (5,151,345).

Arnold teaches polycationic solid supports that can be used purification of nucleic acids (see abstract). The polycationic support matrix is taught to include inorganic and

organic materials which include glasses, polyolefins and polysaccharides (col.8, lines 55-62).

However, neither Boom or Deggerdal nor Arnold specifically teaches that polyolefin is a mixture of low density polyethylene and polypropylene fibers.

However, Hasebe teaches that "a polyolefin resin is preferred, and low-density polyethylene, high-density polyethylene...or a blend thereof is preferably used"(col. 11, lines 32-39).

Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention was made to combine the methods of Boom or Deggerdal or Harvey and Arnold as discussed above and use the types of polyolefins taught by Hasebe. As Arnold teaches that "polyolefins" may be used in DNA isolation, one of ordinary skill in the art would have been motivated to use a preferred polyolefin resin.

Response to Arguments

The response traverses the rejection. The response asserts the combination of references to not teach or suggest an arrangement of a lysing matrix treated with a lysing reagent and a RNA digesting enzyme. This argument has been considered but is not convincing because the response fails to point to any missing elements of the combination. Moreover, the response directs the examiners attention to the discussion in Item 5. This argument has been reviewed above for the reasons above and those already of record, the rejection is maintained.

Conclusion

12. **No Claims are allowable over the prior art.**

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) Harvey et al. Clinical Chem. Vol. 41, pages S108, No. 6, 1995. Harvey teaches impregnating paper with chaotropic salts and their efficiencies. DNA from blood spots collected on guanidine impregnated paper was released in high levels and contained little if any inhibitory substance for PCR. Blood collection paper treated with this chaotrope provides a rapid and reproducible method for the preparation of DNA from died blood spots.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Jeanine Goldberg whose telephone number is (571) 272-0743. The examiner can normally be reached Monday-Friday from 7:00 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla, can be reached on (571) 272-0735.

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The Central Fax Number for official correspondence is (571) 273-8300.

J. Goldberg

Jeanine Goldberg
Primary Examiner
April 26, 2007